

Amendments to the Claims:

Please rewrite the claims as follows:

Claims 1 - 10 (Cancel)

11. (New) A liquid type identification device which identifies a liquid to be measured belonging to a hydrocarbon-based liquid or an alcohol-based liquid, comprising:

an identification sensor unit which faces a flow passage of the liquid to be measured, the identification sensor unit including a liquid type detection unit with indirect heating which includes a heating body and a temperature-sensitive body and including a liquid temperature detection unit which detects the temperature of the liquid to be measured; and

an identification calculation unit which applies a single pulse voltage to the heating body of the liquid type detection unit with indirect heating so as to generate heat and identifies the liquid to be measured according to an output of a liquid type detection circuit formed by the temperature-sensitive body of the liquid type detection unit with indirect heating and the liquid temperature detection unit,

wherein the identification calculation unit identifies the liquid to be measured according to a liquid-type-corresponding first voltage value and a liquid-type-corresponding second voltage value, the liquid-type-corresponding first voltage value corresponding to a difference between the initial temperature of the temperature-sensitive body and a first temperature thereof at a time point when a first time period has elapsed from the start of application of the single pulse, the liquid-type-corresponding second voltage value corresponding to a difference between the initial temperature of the temperature-sensitive body and a second temperature thereof at a time point when a second time period longer than the first time period has elapsed from the start of the application of the single pulse.

12. (New) The liquid type identification device as claimed in claim 11, wherein the second time period is the application time of the single pulse.

13. (New) The liquid type identification device as claimed in claim 11, wherein the first time period is 1/2 or less of the application time of the single pulse.

14. (New) The liquid type identification device as claimed in claim 11, wherein the first time period is 0.5 to 1.5 seconds.

15. (New) The liquid type identification device as claimed in claim 11, wherein the application time of the single pulse is 3 to 10 seconds.

16. (New) The liquid type identification device as claimed in claim 11, wherein an averaged initial voltage value obtained by sampling the initial voltage before the start of the single pulse application to the heating body for a predetermined number of times and averaging the sampled values is used as a voltage value corresponding to the initial temperature of the temperature-sensitive body; an averaged first voltage value obtained by sampling a first voltage at a time point when the first time period has elapsed from the start of the single pulse application to the heating body for a predetermined number of times and averaging the sampled values is used as a voltage value corresponding to the first temperature of the temperature-sensitive body; an averaged second voltage value obtained by sampling a second voltage at a time point when the second time period has elapsed from the start of the single pulse application to the heating body for a predetermined number of times and averaging the sampled values is used as a voltage value corresponding to the second temperature of the temperature-sensitive body; a difference between the averaged first voltage value and averaged initial voltage value is used as the liquid-type-corresponding first voltage value; and a difference between the averaged second voltage value and averaged initial voltage value is used as the liquid-type-corresponding second voltage value.

17. (New) The liquid type identification device as claimed in claim 11, wherein a liquid temperature-corresponding output value corresponding to the temperature of the liquid to be measured is input to the identification calculation unit from the liquid temperature detection unit, and the identification calculation unit uses a calibration curve indicating a relationship between the liquid temperatures and liquid-type-corresponding first voltage values of a plurality of types of known reference liquids to be measured to determine whether the liquid to be measured is the hydrocarbon-based liquid or alcohol-based liquid based on the liquid temperature-corresponding

output value and liquid-type-corresponding first voltage value obtained for the liquid to be measured.

18. (New) The liquid type identification device as claimed in claim 17, wherein a liquid temperature-corresponding output value corresponding to the temperature of the liquid to be measured is input to the identification calculation unit from the liquid temperature detection unit, and the identification calculation unit uses a calibration curve which is created respectively for the hydrocarbon-based liquid and alcohol-based liquid and which indicates a relationship between the liquid temperatures and liquid-type-corresponding second voltage values of a plurality of types of known reference liquids to be measured belonging respectively to the hydrocarbon-based liquid and alcohol-based liquid to identify the liquid to be measured based on the liquid temperature-corresponding output value, liquid-type-corresponding second voltage value and the determination result obtained for the liquid to be measured.

19. (New) The liquid type identification device as claimed in claim 11, wherein the identification calculation unit includes a microcomputer.

20. (New) The liquid type identification device as claimed in claim 11, wherein both the liquid type detection unit with indirect heating and liquid temperature detection unit respectively include a heat transfer member for liquid type detection unit and a heat transfer member for liquid temperature detection unit, which are used for heat exchange with the liquid to be measured.

21. (New) A liquid type identifying method, which identifies whether or not a liquid to be measured which is a hydrocarbon-based liquid or an alcohol-based liquid is of a predetermined type by sensing heat generated by energization with a temperature sensor, the identification of whether or not the liquid to be measured is a predetermined hydrocarbon-based liquid or alcohol-based liquid being made based on a combination of a liquid-type-corresponding first voltage value corresponding to a difference between an initial temperature of the temperature sensor and a first temperature thereof obtained at the time point after a first time period has elapsed from a start of the energization and a liquid-type-corresponding second voltage value corresponding to a

difference between the initial temperature of the temperature sensor and a second temperature thereof obtained at the time point after a second time period, which is longer than the first time period, has elapsed from the start of the energization.

22. (New) The liquid type identifying method as set forth in claim 21, which identifies whether or not the liquid to be measured is a hydrocarbon-based liquid or an alcohol-based liquid of a predetermined type or with a predetermined solute concentration based on a combination of the liquid-type-corresponding first voltage value and the liquid-type-corresponding second voltage value.

23. (New) The liquid type identifying method as set forth in claim 21, wherein the current is applied by applying a single pulse voltage and the heat generated by the energization is transferred through the liquid to be measured to the temperature sensor disposed to face the liquid.

24. (New) The liquid type identifying method as set forth in claim 21, wherein the predetermined type is gasoline or light oil.

25. (New) The liquid type identifying method as set forth in claim 23, wherein the single pulse voltage is applied to a heater disposed to face the liquid to be measured.

26. (New) The liquid type identifying method as set forth in claim 21, wherein it is determined that the liquid to be measured is a hydrocarbon-based liquid or an alcohol-based liquid having a predetermined specific gravity only when both the liquid-type-corresponding first voltage value and liquid-type-corresponding second voltage value fall within their respective predetermined ranges and, otherwise, it is determined that the liquid to be measured is not a hydrocarbon-based liquid or an alcohol-based liquid having a predetermined specific gravity.

27. (New) The liquid type identifying method as set forth in claim 21, wherein it is determined that the liquid to be measured is gasoline or light oil having a predetermined specific gravity only when both the liquid-type-corresponding first voltage value and liquid-type-

corresponding second voltage value fall within their respective predetermined ranges and, otherwise, it is determined that the liquid to be measured is not gasoline or light oil having a predetermined specific gravity.

28. (New) The liquid type identifying method as set forth in claim 26, wherein the predetermined range of the liquid-type-corresponding first voltage value and that of the liquid-type-corresponding second voltage value change depending on a temperature of the liquid to be measured.

29. (New) The liquid type identifying method as set forth in claim 21, wherein the liquid-type-corresponding first voltage value and liquid-type-corresponding second voltage value are obtained based on outputs of a liquid type detecting circuit including both the temperature sensor and a liquid temperature detecting section for detecting a temperature of the liquid to be measured.

30. (New) The liquid type identifying method as set forth in claims 21, wherein an average initial voltage value which is obtained by sampling an initial voltage predetermined number of times before the start of application of the single pulse to the heater and averaging them is used as a voltage value corresponding to the initial temperature of the temperature sensor, an average first voltage value which is obtained by sampling a first voltage at the time after the first time period has elapsed from the start of application of the single pulse to the heater predetermined number of times and averaging them is used as a voltage value corresponding to the first temperature of the temperature sensor, an average second voltage value which is obtained by sampling a second voltage at the time after the second time period has elapsed from the start of application of the single pulse to the heater predetermined number of times and averaging them is used as a voltage value corresponding to the second temperature of the temperature sensor, a difference between the average first voltage value and average initial voltage value is used as the liquid-type-corresponding first voltage value, and a difference between the average second voltage value and average initial voltage value is used as the liquid-type-corresponding second voltage value.

31. (New) The liquid type identifying method as set forth in claims 21, wherein a liquid temperature-corresponding output value corresponding to the temperature of the liquid to be measured is input to the identification calculation unit from the liquid temperature detection unit, and the identification calculation unit uses a calibration curve indicating a relationship between the liquid temperatures and liquid-type-corresponding first voltage values of a plurality of types of known reference liquids to be measured to determine whether the liquid to be measured is the hydrocarbon-based liquid or alcohol-based liquid based on the liquid temperature-corresponding output value and liquid-type-corresponding first voltage value obtained for the liquid to be measured.

32. (New) The liquid type identifying method as set forth in claim 31, wherein a liquid temperature-corresponding output value corresponding to the temperature of the liquid to be measured is input to the identification calculation unit from the liquid temperature detection unit, and the identification calculation unit uses a calibration curve which is created respectively for the hydrocarbon-based liquid and alcohol-based liquid and which indicates a relationship between the liquid temperatures and liquid-type-corresponding second voltage values of a plurality of types of known reference liquids to be measured belonging respectively to the hydrocarbon-based liquid and alcohol-based liquid to identify the liquid to be measured based on the liquid temperature-corresponding output value, liquid-type-corresponding second voltage value and the determination result obtained for the liquid to be measured.

33. (New) The liquid type identifying method as set forth in claims 21, wherein the identification calculation unit includes a microcomputer.

34. (New) The liquid type identifying method as set forth in claim 21, wherein both the liquid type detection unit and liquid temperature detection unit respectively include a heat transfer member for liquid type detection unit and a heat transfer member for liquid temperature detection unit, which are used for heat exchange with the liquid to be measured.